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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,577	03/11/2004	Satoshi Kume	403003/TAKADA	4813
23548 7590 10/17/2007 LEYDIG VOIT & MAYER, LTD 700 THIRTEENTH ST. NW SUITE 300 WASHINGTON, DC 20005-3960			EXAMINER MACARTHUR, SYLVIA	
			ART UNIT 1792	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/797,577

Applicant(s)

KUME ET AL.

Examiner

Sylvia R. MacArthur

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 4-17 is/are pending in the application.
- 4a) Of the above claim(s) 7-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4-6 and 15-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendments and Arguments***

1. The cancellation of claims 2 and 3, has caused the previous 35 USC § 112 rejection to be moot.
2. The amendment of claim 4 has defined the relationship between the first/second ultraviolet units and the stage. Such that it positively recited that that the ultraviolet units are opposite the stage and thus it is interpreted that the stage and ultraviolet units are in the same chamber. The amendment of claim 4 reciting the type of film etched by the claimed wet etching apparatus (in both the preamble and the body of the claim) is interpreted as a matter of intended use and its not given structural patentable weight as an apparatus is what it is and its not further narrowed structurally by how or the intended use or purpose of the apparatus, Ex Parte Masham, 2USPQ2d 1647 (Bd. Pat. App. & Inter. 1987) and In re Schrieber, 128 F. 3d '473, '477, 44USPQ2d 1429, 1431 (Fed. Cir. 1997). The amendment of claim 4 also led to the interpretation of the first and second UV radiation units as a plurality of lamps that can be housed seperately of together.
3. Regarding the amendment of claim 5, the type of ambient has been clarified and will be addressed in the rejection below.
4. The previously made double patenting rejections to Application Numbers 10/765,272 and 10/441,061 have been withdrawn are now abandoned as stated in the remarks dated 8/8/2007 on page 8 paragraph 2.

### ***Claim Rejections - 35 USC § 102***

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5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 4-6 are rejected under 35 U.S.C. 102(a) as being anticipated by Matsuno et al (JP 2002-3160141, refer to the English Translation also provided).

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent..

Matsuno et al teaches a treating apparatus using a first dielectric barrier lamp and a second dielectric barrier lamp, see Figs, 1 and 3-7.

Regarding claims 4 and 6: The apparatus of Matsuno et al teaches a first UV radiation unit (lamp 6, lamp group 41,63) having a wavelength not exceeding 200nm 120-190 nm, near 172 nm see [0015] and a second UV radiation unit (lamp 7, lamp group 42,66) having a wavelength exceeding 200nm, in the range of 200-240 nm, near 222nm, see [0015]. See also [0024, 0025, and 0028]. This claim is interpreted as a matter of an intended use in that the claim recite that the energy of the second UV irradiation unit is higher than the binding energy of the film. The “film”/ “high-k film” refers to a film disposed upon the substrate which is not part of the structure of the claimed apparatus and thus does not structurally limit the apparatus of Matsuno et al. See also [0013] wherein Matsuno et al teaches that the second irradiation unit teaches decomposition by the photochemical reaction with the UV rays.

Matsuno teaches stage 34 is Fig.3, stage that holds the substrate 43 in Fig.4, a stage 64 is Fig. 6 and stage 72 in Fig.7. The apparatus of Matsuno et al teaches a first UV radiation unit (lamp 6, lamp group 41,63) having a wavelength not exceeding 200nm 120-190 nm, near 172 nm see [0015] and a second UV radiation unit (lamp 7, lamp group 42,66) having a wavelength exceeding 200nm, in the range of 200-240 nm, near 222nm, see [0015]. See also [0024, 0025, and 0028]. Regarding the chemical-solution coating unit a chemical solution coating unit inherently exists though unshown as [001] teaches that an amorphous Si thin film is disposed upon the substrate.

Regarding claim 5: Section [0019] teaches that hydrogen peroxide is supplied which anticipates an oxygen atmosphere. Note [0021] teaches other sources of oxygen used.

7. Claims 4-6 are rejected under 35 U.S.C. 102(a) as being anticipated by Hirae et al (US 2001/001392).

Regarding claim 4: Hirae et al teaches a wet etching apparatus as illustrated in Figs 2-7. The apparatus comprises a stage 1 (the stage supports and rotates the wafer, see Figs.2-7 )and a nozzle 7 (reads on the chemical solution coating unit) as it is structurally capable of supplying a chemical solution for the purpose of coating. Note this limitation is interpreted as a matter of an intended use.

Hirae et al teaches a movable irradiating unit 31(lamp housing). The individual lamps are interpreted as the first and second UV radiating units. This claim is interpreted as a matter of an intended use in that the claim recites that the energy of the second UV irradiation unit is higher than the binding energy of the film. "The high-k film" refers to a film disposed upon the

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substrate which is not part of the structure of the claimed apparatus and thus does not structurally limit the apparatus of Hirae et al.

Regarding claim 5: The stage of Hirae et al treats the substrate in ambient including oxygen as ozone water is supplied via feeder 21.

Regarding claim 6: This claim is interpreted as a matter of an intended use in that the claim recite that the energy of the second UV irradiation unit is higher than the binding energy of the film. "The high-k film" refers to a film disposed upon the substrate which is not part of the structure of the claimed apparatus and thus does not structurally limit the apparatus of Hirae et al.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 15- 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirae et al (US 2001/0001392) in view of Hiramoto et al and Kinoshita et al.

Regarding claims 15 and 16: Hirae et al teaches a wet etching apparatus as illustrated in Figs 2-7. The apparatus comprises a stage 1 (the stage supports and rotates the wafer, see Figs.2-7 ) and a nozzle 7 (reads on the chemical solution coating unit) as it is structurally capable of supplying a chemical solution for the purpose of coating. Note this limitation is interpreted as a matter of an intended use.

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Hirae et al teaches a movable irradiating unit 31(lamp housing) .The individual lamps are interpreted as the first and second UV radiating units, but Hirae etl fails to teach a) the lamps are independently operable and b) that the housing features a transparent window.

Hiramoto et al teaches a process for oxidizing an article wherein a first UV radiating unit 102 radiates UV light having a wavelength of less than 200nm, specifically 172 nm as recited in col. 9 lines 1-20 and a second UV light radiating unit radiating UV light exceeding 200nm, specifically 254nm as recited in the paragraph joining cols. 10 and 11 – col. 11 line 20, see Figs. 8 and 9.

The motivation to use the ultraviolet light radiation units 102 and 103 of Hiramoto is that the first radiating unit provides the first significant feature of a path-braking measure in which a dielectric barrier discharge lamp is used to emit light with a wavelength of 172nm as a vacuum UV ray with high efficiency. The irradiating unit of Hiramoto provides a second significant feature of the simultaneous use of lamp with emits a light of a wavelength of 254 nm, producing a high concentration of activated oxygen is produced from ozone with a high efficiency while increasing the activity, see the paragraph joining cols 4 and 5 to col. 5 line 25 . Because it is clear that the lamps of Hiramoto use different wavelengths they are also independently operable, furthermore the method of Hiramoto et al teaches that the lamps are used a separate time with the treatment. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to use the irradiating units of Hiramoto et al in the apparatus of Hirae et al.

Hirae et al in view of Hiramoto et al fails to specifically teach the storage unit, the window and the housing filled with inert gas.

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Kinoshita et al teaches an apparatus for processing a substrate comprising a lamp house provided with dielectric barrier discharge lamps to irradiate a substrate with UV light. Col. 7 lines 32-47 teaches that the lamp house (storage unit) 112 having a transmitting window 112a (transparent to transmit the UV energy) is filled with an inert gas. The motivation of using the storage unit/lamp house of Kinoshita et al is that it provide a mechanism to completely enshroud the UV radiating units to seal the inert gas within the storage unit. Col. 5 lines 40-49 teach the motivation of using the inert gas in the lamp house. Therein, Kinoshita et al teaches that the motivation for filling the lamp house with an inert gas, nitrogen is to maintain the an oxygen free atmosphere within the lamp house.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to use the lamp house (storage unit) of Kinoshita et al to simplify the construction of the irradiation unit and provide an inert gas to fill the lamp house (storage unit) in the apparatus of Hirae et al in view of Hiramoto et al.

Regarding claim 17: The apparatus of Hirae et al features a drive means to move the lamp housing transverse to the stage, closer to and farther from the substrate, see the Figures and see also [0056-0058].

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art of Kizaki et al (US 5,763,892) teaches a UV radiation unit 41, stage 25, Tsunekawa et al (US 5,478,401) teaches a UV radiation unit 7, stage 2, Morinville et al (US 5,709,754) teaches UV radiation unit 50, stage 26, in an oxygen ambient, and Nenyeyi et al (US 2003/0155000) teaches lamps 7,9.



***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-Th during the hours of 8 a.m. and 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Sylvia R MacArthur  
Primary Examiner  
Art Unit 1792

October 11, 2007